

**Amendments to the Specification:**

On page 5, add the following paragraphs following paragraph [0018]:

[0018A] In accordance with one aspect, the present invention is a method of transmitting data in a wireless MC-CDMA system to a set of  $M$  users. The method includes providing a transmitter system with  $N$  sub-carriers divided into  $G$  groups,  $N$  and  $G$  being integers; determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of subcarriers; and for each user and in each group of sub-carriers, using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter.

[0018B] In accordance with another aspect, the present invention is a transmitter for wirelessly transmitting data to a set of  $M$  users. The transmitter includes a modulator, circuitry for calculating, and resource allocation means. The modulator is for modulating  $N$  sub-carriers that are divided into  $G$  groups, where  $N$  and  $G$  are integers. The calculation circuitry is for calculating an instantaneous group SNR using an effective channel function for each user in each group of sub-carriers. The resource allocation means is for allocating, using the instantaneous SNR of an equivalent single sub-carrier as a metric, at least one resource for each user and in each group of sub-carriers.

[0018C] In accordance with another aspect, the present invention is a program of machine-readable instructions, tangibly embodied on an information bearing medium and executable by a digital data processor, to perform actions directed toward transmitting data in a wireless multi-carrier spread spectrum communication system. The actions include providing a transmitter system with  $N$  subcarriers divided into  $G$  groups, where  $N$  and  $G$  being integers. They further include determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of sub-carriers. They also include, for each user and in each group of sub-carriers, using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter.

Replace the paragraph [0053] at page 12, with the following rewritten paragraph:

[0053] That is, an N sub-carrier MC-CDMA system (consisting of G groups of N/G sub-carriers) may be interpreted as an equivalent OFDM system with  $\frac{N}{G}$  sub-carriers. Such an interpretation effectively turns a MC-CDMA system (in its current configuration) into a multi-carrier system similar to a conventional OFDM system. Equation (6) allows the effective sub-channel power to noise ratio to be evaluated and conventional bit loading schemes based on channel state information to be implemented; i.e. bits will be loaded into the N/G sub-carriers in a group as though they were a single sub-carrier.

Replace the paragraph 78 at page 18, with the following rewritten paragraph:

[0078] ~~Now, the optimization problem may be stated as,~~

$$\begin{aligned} & \text{minimize } \sum_{k=1}^{N/G} b_k \\ & \text{i. subject to } \begin{aligned} & - \sum_{k=1}^{N/G} P_k - P_{total} \leq 0 \\ & \varepsilon_k - \bar{\varepsilon}_0 \leq 0 \end{aligned} \quad \text{for } k=1, 2, \dots, N/G \end{aligned}$$

Now, the optimization problem may be stated as,

$$\begin{aligned} & \text{minimize } \sum_{k=1}^G b_k \\ & \text{i. subject to } \begin{aligned} & - \sum_{k=1}^G P_k - P_{total} \leq 0 \\ & \varepsilon_k - \bar{\varepsilon}_0 \leq 0 \end{aligned} \quad \text{for } k=1, 2, \dots, G \end{aligned} \quad (10)$$

Replace the paragraph 79 at page 18, with the following rewritten paragraph:

[0079] where  $b_k$  is the number of bits allocated to the  $k^{\text{th}}$  (equivalent) sub-carrier,  $P_k$  is the power assigned to the  $k^{\text{th}}$  (equivalent) sub-carrier,  $P_{\text{total}}$  is the total power available to the user,  $\epsilon_k$  and  $\bar{\epsilon}_k$  is the BER and BER bound respectively, and  $N/G$   $G$  is the total number of (equivalent) sub-carriers. The problem written as a Lagrangian is,

Replace the paragraph 80 at page 18, with the following rewritten paragraph:

[0080] ~~$$J_R = -\sum_{k=1}^{N/G} b_k + \lambda \sum_{k=1}^{N/G} P_k$$~~

$$J_R = -\sum_{k=1}^G b_k + \lambda \sum_{k=1}^G P_k \quad (11)$$

Replace the paragraph 81 at page 18, with the following rewritten paragraph:

[0081] ~~where  $\lambda$  is the Lagrange multiplier. After solving for  $P_k$  and  $\lambda$ , the expression for  $P_k$  that maximizes the data rate is,~~

~~i. 
$$P_k = \frac{\sigma^2 \ln(\bar{\epsilon}_k / 0.2)}{1.6 |H_{\text{eff},k}|^2} + \frac{P_{\text{total}}}{N/G} - \frac{1}{N/G} \sum_{i=1}^{N/G} \frac{\sigma^2 \ln(\bar{\epsilon}_i / 0.2)}{1.6 |H_{\text{eff},i}|^2}$$~~

where  $\lambda$  is the Lagrange multiplier. After solving for  $P_k$  and  $\lambda$ , the expression for  $P_k$  that maximizes the data rate is,

i. 
$$P_k = \frac{\sigma^2 \ln(\bar{\epsilon}_k / 0.2)}{1.6 |H_{\text{eff},k}|^2} + \frac{P_{\text{total}}}{G} - \frac{1}{G} \sum_{i=1}^G \frac{\sigma^2 \ln(\bar{\epsilon}_i / 0.2)}{1.6 |H_{\text{eff},i}|^2} \quad (12)$$